Washington State Onsite Wastewater Rule Development Committee
November 14, 2003

SeaTac Occupational Skills Center
18010 8th Avenue South
SeaTac, Washington
(Meetings # 16 notes)

Attendance

Representation	*Members / Alternates*	*2/13*	*3/28*	*5/22*	*7/17*	*9/19*	*10/24*	*12/12*	*1/23*	*3/13*	*4/24*	*5/6*	*6/18*	*7/23*	*10/7*	*10/23*	*11/14*
WA Assoc of Realtors	**Slough, Frederick**	+	+	+	+		+			+	+						
	Stout, Larry		+										+				
Building Industry of WA	**Stanton E.C. (J. Slavik)**	+	+	+		+		+		+		+	+	+			+
	Kunkel, Jenn	+		+	+	+	+	+	+	+	+	+	+	+	+		+
On-Site Wastewater Designer	**Wecker, Steve**	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+
	Lombardi, Pete	+					+	+		+			+	+	+	+	+
On-Site Wastewater Installer	**Stuth, Jr., Bill**	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
	Stonebridge, Jerry	+															
Certified Proprietary Device Specialist	**Garrison, Carl**	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Morris, Mike																
OSS Pumper/O&M Specialist	**Tacia, Reed**	+	+	+	+	+	+	+	+	+	+	+		+	+	+	
	Markle, Steve	+	+			+	+	+	+	+	+	+		+	+		
Proprietary Products At-Large	**Patterson, Jim**	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+
Planning WA Assoc of Counties	**Shuttleworth, Mike**		+	+	+	+	+		+	+				+	+	+	
Local Health Jurisdictions (Westside-Urban)	**Deeter, Jerry**	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Starry, Art	+			+		+		+			+		+	+	+	
Local Health Jurisdictions (Westside-Rural)	**Higman, Keith**		+				+	+		+					+	+	+
	Fay, Larry	+			+		+	+							+		
Local Health Jurisdictions (Eastside-Urban)	**Perkins, Bruce**		+	+					+	+	+	+	+	+	+	+	
	Dawson, Rick	+	+	+	+	+	+		+	+	+	+	+	+	+	+	
Local Health Jurisdictions (Eastside-Rural)	**Barry, Kevin**	+	+	+	+	+	+		+	+	+	+	+	+	+	+	
	Wolpers, John																
Soil Scientist	**Cogger, Craig**						+	+	+	+			+	+	+	+	
	Hermann, C			+													
Puget Sound Water Quality Action Team	**Hull, Terry**	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Indian Health Services	**Dalton, Robin**	+	+	+	+	+											
WA Shellfish Industry	**Dewey, Bill**			+	+	+	+		+	+	+	+	+	+	+	+	+
	Taylor, Bill					+		+									
WA Dept of Ecology	**Kimsey, Melanie**		+		+	+	+		+		+	+	+	+	+	+	
	Shaleen-Hansen, Mary	+					+										
WA Assoc of Water & Sewer Dist	**Hart, James**		+	+		+						+	+			+	+
	Wiggins, Margaret	+	+							+	+						
Consumer	**Smith, Denise**	+	+	+	+	+	+		+		+	+	+	+	+		
	Salkind, Mark	+	+	+		+	+	+	+	+	+	+	+	+	+		
WA Dept of Health	**Soltman, Mark**	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
People for Puget Sound	**Wishart, Bruce**																
WA Public Utilities Districts	**Kukuk, Ken**																
	Robertson, Robbie																
Professional Engineer	**Yuhl, Mike**	+	+	+		+	+	+		+	+	+	+	+	+	+	+
Tribal Government	**McMurtrie, Doug**	+	+	+	+	+	+		+	+	+	+	+	+	+		

*+ Present at meeting, **Members and** Alternates*

Agenda

November 14, 2003
SeaTac Occupational Skills Center
18010 8th Avenue South
SeaTac, Washington

Time	Agenda Item	Outcome	Lead
10:00	Welcome		Maryanne Guichard
10:10	Agenda Review/		Eric Svaren
10:15	Miscellaneous Proposals	Decisions on Proposals	
11:15	Next steps for the rule revision		Maryanne Guichard
12:00	Lunch		
12:30	Definitions	Work Group Report	
1:20	Field Performance		
1:45	Wrap-up		Eric Svaren
2:00	Adjourn		

On November 14th the RDC discussed and voted on the following definitions and miscellaneous proposals submitted by members as suggestions for revision to the August 15th draft rule revision on WAC 246-272. Each proposal was discussed and voted whether to approve (green card), to reject (red card), or "can live with it" (yellow card). Revisions to the draft rule will reflect the proposals accepted by a 2/3 majority of the voting RDC members (or their alternates) present at the meeting.

Decisions on proposed draft language changes:

Definitions and Miscellaneous Proposals

Voted on November 14, 2003 (RDC members present 11)

Proposer's Name	**Proposal Number (Refers to August 15 draft of the revised rule 246-272)**	**Decision of the RDC**	**Vote** Green = Approve Yellow = "Can live with it" Red = Reject
Jim Patterson	**# 21:** (6) The local health officer has authority and approval over; DELETE: "(b) Any Large Onsite Sewage System for which jurisdiction has been transferred to a local health jurisdiction from the department by contract."	Rejected	Green 0, Yellow 0, Red 11.
Bruce Perkins and Rick Dawson	**#22:** Should read: Local Boards of health Shall require new developments to connect to a public sewer when said sewer is less than 200 feet from the development…	Rejected	
Stephen Wecker	**# 28**: change signature of applicant to owner and add need for signature of designer.	Approved	
Bruce Perkins and Rick Dawson	**#33:** Delete "Non-public" from non-public well of suction line	Approved	
Jerry Deeter	**# 34** Eliminate newly added last-row of table concerning "down-gradient cuts or banks… restrictive layer to less than 12 inches", amend the "Interceptor/curtain drains/drainage ditches" row to include this new language.	Passed	

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Definitions and Miscellaneous Proposals

Voted on November 14, 2003 (RDC members present 11)

Proposer's Name	Proposal Number (Refers to August 15 draft of the revised rule 246-272)	Decision of the RDC	Vote Green = Approve Yellow = "Can live with it" Red = Reject
Bruce Perkins and Rick Dawson	**#36:** The local health officer or department shall permit only engineers, qualified designers, soil scientist and **qualified inspectors** to perform soil and site evaluations.	Withdrawn	
Carl Garrison	**#37:** (2) (a) Compare with / Refer to DOL standards of practice (2) (a) (vii) include setbacks to lined surface water=buildings? (2) (c) Change SCS to National Resource Conservation Service Table V should be dropped and replaced with existing chart. Use of the term "gravelly" confusing…	Withdrawn	
Art Starry	**#39:** The local health officer shall permit only *professional* engineers, designers and soil scientists to perform soil and site evaluations, except: (a) Where the local health officer performs the soil and site evaluation.	Passed	Green 11, Yellow 0, Red 0.
Stephen Wecker	**# 43:** I question whether homeowners can design their own systems. Has this been checked with DOL?	Withdrawn	

Decisions on proposed draft language changes:

Definitions and Miscellaneous Proposals

Voted on November 14, 2003 (RDC members present 11)

Proposer's Name	Proposal Number (Refers to August 15 draft of the revised rule 246-272)	Decision of the RDC	Vote Green = Approve Yellow = "Can live with it" Red = Reject
Bruce Perkins and Rick Dawson	**# 44:** The OSS is designed to treat and dispose of the maximum daily design flow and quality. (RDC approved the revised definition for "Design Flow" developed by the definitions committee.)	Withdrawn pending decision on revised definitions.	
Art Starry	**#45:** ~~Fecal coliform constituents that create concerns due to a specific site sensitivity~~. The sensitivity of the site where the OSS will be installed. Examples include areas where fecal coliform constituents can result in public health concern, such as ~~Examples include~~ shellfish growing areas, designated swimming areas, etc.	Approved	Green 11.
Bruce Perkins and Rick Dawson	**#46:** Add a footnote to soil type 2 to allow gravity distribution when: Annual precipitation in the region is less than 25 inches per year as described by "Washington Climate".	Rejected	Mostly red cards.
Jerry Deeter	**# 50**: Beds should be allowed for soil types 3-6, not 1-3. Finer grain soils with lower loading rates do a better job of helping to distribute and disperse effluent in a bed configuration….	Withdrawn (Must go back to the TRC)	
Bruce Perkins and Rick Dawson	**# 52** Change to: Visit the OSS site *one or more times as may be considered needed* during the site evaluation and final construction inspection.	Rejected	

Decisions on proposed draft language changes:

Definitions and Miscellaneous Proposals

Voted on November 14, 2003 (RDC members present 11)

Proposer's Name	**Proposal Number (Refers to August 15 draft of the revised rule 246-272)**	**Decision of the RDC**	**Vote** Green = Approve Yellow = "Can live with it" Red = Reject
Art Starry	**#55**: (~~g~~)(a) Back fill <u>with ~~a minimum of~~ between 6 and 24 inches of mineral soil</u> and grade the site to prevent surface water from accumulating over any component of the OSS;	Approved	
Jim Patterson	**# 64:** (5) "Disinfection products shall not be used to meet the minimum treatment level required on repair sites with less than ~~12~~ 18 inches of vertical separation."	Approved	Green 11.
Carl Garrison	**# 65:** Re-instate requirements for TAC membership.	Approved with revisions	
Bruce Perkins and Rick Dawson	**#66**: Add a section that indicates that anyone violating these rules will be subject to the penalties under RCW 70.05 and 43.70.190	Approved with the intent that the changes increase enforcement tools. Will be reviewed by the AG.	Green 7 Yellow 1, Red 3.

The following four handouts were distributed and discussed:

Onsite Rule Development Process and Timeline

Draft for November 14, 2003

Onsite Advisory Report to the State Board of Health (SBOH). SBOH approval to begin rule development process.	November 2001
File CR101 with Code Revisers Office	January 2002
Rule Development Activity and Draft of Proposed Rule for SBOH.	February 2002-November 2003
RDC submits minority reports for inclusion in report for the SBOH.	December 5, 2003
Draft Report to RDC members for comment.	December 22, 2003
RDC comments on Report to DOH	January 9, 2004
Final Report to the SBOH	February 1, 2004
SBOH consideration and input to Draft Rule	March 10, 2004
Finalize formal rule proposal and supporting analysis (CR102 packet).	March – June 2004
File CR102 with Code Revisers Office	June –July 2004
Public Comment Period	July – August 2004
SBOH Public Hearing on Proposed Rule	September 2004

Chapter 246-272A WAC - Definitions
RDC – November 14, 2003

The following is a summary of the work done by the definitions subcommittee. The committee considered all the words that received proposals for definition. For those words that do not show a definition, the committee felt that the definition in the dictionary was accurate to describe the word, or that the current definition did not need to be changed. **(On November 14th the RDC edited and approved the following definitions.)**

These terms are not in the current draft but received proposals for definitions:

As-built – This term became "construction record." **"Construction Record"** means an accurate graphic and written record of the location and features of the OSS that are needed to properly monitor, operate, and maintain that system.

Bed - **"Bed"** means a soil dispersal component greater than 3 feet in width.

Timed Dosing -**"Timed Dosing"** means delivery of predetermined volumes of sewage uniformly released after prescribed resting intervals.

Building Sewer
Dimensional
Inspection
Permit
Service access
Wastewater Tanks

Any terms that were suggested for definition but that were not used in the current draft were omitted.

These terms are defined in the current draft but received proposals for amendments:

Certified Inspector -**"Certified Inspector"** means an employee of a local health jurisdiction who holds a certificate of competency from the Washington state department of licensing under chapter 18.210 RCW or as allowed under RCW 70.118.120.

Design Flow "Design Flow" means the daily flow rate used to size an onsite sewage system. It is always greater than the sustained operating flow rate.

Development - **"Development"** means the creation of a residence, structure, facility, mobile home park, subdivision, planned unit development, site, area, or similar activity resulting in the production of sewage.

OSS - "**Onsite sewage system" (OSS)** means a sewage treatment system, located on or nearby the property it serves, consisting of a treatment component or treatment sequence and a soil dispersal component. An onsite sewage system may also refer to a holding tank sewage system or other system that does not have a soil dispersal component.

Residential Sewage - **"Residential sewage"** means the liquid waste transported from a structure to an OSS measured at the septic tank outlet. Single sample values are expected to be less than CBOD of …,

TSS of … and FOG of … and pH of … *(The TRC will develop numbers for these values)*

Treatment train - **"Treatment sequence**" means any series of treatment components that discharge treated wastewater to the soil dispersal component.

Additive
Monitoring
Surface Water

(3) *246-272A-0260(3) The designer or installer, as directed by the local health officer, upon completion of the new construction, alteration or repair of the OSS shall develop and submit a complete and detailed, construction record to both the health officer and the OSS owner that include at a minimum the following:

(a) Measurements, accurate to within one-half foot, shall be made from at least two nearby, clearly visible objects that are likely to remain, to these parts of the OSS:

(i) All septic tank and pump openings needed to access;

(ii) The ends, and all changes in direction, of buried pipes and cables;

(iii) Any other OSS component which, in the judgment health officer or the designer, must be accessed for observation, maintenance, or operation; and

(iv) Location and dimensions of reserve area.

(b) Initial settings of electrical or mechanical devices which must be known to operate the system in the manner intended by the designer or installer.

(c) Manufacturer's standard product literature, including performance specifications and maintenance recommendations needed for operation, monitoring, maintenance or repair of the OSS.

Field Sampling Protocol, Test Parameters, and Threshold Values

The DRAFT onsite rule provides a series of threshold values for treatment component performance testing: Level A through Level E. These threshold values are applied to the results of testing accomplished according to established protocols. For $CBOD_5$, TSS, and FOG these values are 30-day average values. For fecal coliform, the values are 30-day geometric means.

Typical field monitoring of system performance may involve sampling and testing once or twice a year. This frequency of sampling presents different challenges for assessing system function in the field compared to the testing setting. Applying 30-day average threshold values to field monitoring is not appropriate.

If applying 30-day average threshold values in the field is not appropriate, what value is?

In the work previously undertaken by the Technical Review Committee they focused their attention on the testing framework. Their discussions did identify that a "field standard" would be different than the testing standards, but the outcome of their work did not result in a proposed field standard.

When a treatment component is tested according to NSF Standard No. 40, what is the range of results that contribute to the 30-day average results?

NSF typically reports various data from the test program and presents this data in Final Report documents for products tested. The following table presents some of the results for three sample products.

$CBOD_5$ Mg/L (Effluent)						
Product Name	Maximum 30-day Average	Full Test Average	Minimum	Maximum	Median	Interquartile Range
MicroSepTec	22	6	<2	62	3	< 2 - 6
Cajun Aire	21	13	2	40	10	4 - 19
AdvanTex	8	5	<2	25	3	2- 6

TSS Mg/L (Effluent)						
Product Name	Maximum 30-day Average	Full Test Average	Minimum	Maximum	Median	Interquartile Range
MicroSepTec	16	8	<2	45	6	5 - 9
Cajun Aire	24	19	3	65	16	11 - 24
AdvanTex	6	5	<2	42	3	2- 4

The median is the point where half of the values are greater and half are less.
The Interquartile range is the range of values about the median between the upper and lower 25 percent of all values.

This information is readily available and may give service providers and local regulators some assistance when comparing individual grab sample test results to product performance demonstrated under the required testing protocol.

Proposal: (Approved by the RDC)

The Department of Health and the Technical Review Committee are available to address the matter of threshold values and sampling protocols that may be appropriate for monitoring treatment system performance in the field. Wastewater Management Program staff will research this matter and present their findings at the first TRC meeting in 2004 (anticipated in early February). The manufacturing community will also be contacted for their input to this technical question. The outcome goal for this activity will be a guidance document to assist service providers and local regulators in their field assessment of treatment system performance.

Wastewater Flows from Single Family Residences.

A joint research project by *Public Health, Seattle & King Count*y and Wa*DOH*

Prepared for the RDC by David Christensen RS PHSKC

Inspired by a desire to have a consistent and sensible building remodeling policy in King County, we did a search for information on the prediction of water flows from single family residences. During that search we heard opinions that house square footage should be taken into account in septic sizing design.

Two studies were discovered that indicated this might be the case. A Virginia study dramatically showed that, on average, as houses get larger they use more water. An Aspen Co. Study showed that both bathrooms and square footage had greater linear association with water use than the number of bedrooms.

Two King County Studies

To better assess local data, two random samples of King County Houses were statistically evaluated. The first, "Health 200" (H200), is a sample of 201 houses served by septic. The houses are in 19 housing clusters in 10 separate water districts. County assessor's land records and water records for 2000 and 2001 were used.

Seattle Public Utilities compiled the second sample, "Questionnaire 1000" (Q1000), in 1997. It was the first step in SPU's participation in the "*Residential End Uses of Water Study*." 978 sewered houses were selected from Seattle, Bellevue, Highline, and Northshore water service districts. The study collected water records from early 1994 to early 1996. We took this database and tied it into the assessor's records.

For each house studied, we had the assessor's count of bedrooms, baths, and living area square footage and its' local water district's count of roughly 2 years worth of water use. The Assessor's Square footage figures are quite reliable, but some bedroom and bath information is estimated from external house observations. We have tried to quantify the accuracy of those estimates. Most of the water records are for 60-day periods and are recorded in 100s of cubic feet. This makes the uncertainty of our daily averages roughly +/- 14 gal per day for BI-monthly averages and +/- 3 gallons per day for over all winter averages.

Implications of daily water records

Our most accurate measurements of water use were 60-day averages. To interpret the daily water use fluctuations that occurred during those 60-days, we procured data from the finished "*Residential End Uses of Water Study*" from Seattle Public Utilities. This 1998 study digitally metered water from over 1000 houses in 12 cities across North America. The meter readings, taken every 10 seconds, were done over 2-week periods in both the winter and summer for each house. A computer program identified whether water use was indoor or outdoor. 813 of these houses had daily indoor use readings for at least 26 days. The maximum number of daily readings was 31 days.

Using the "indoor water use" for these 813 houses, we calculated the (peak 24 hour use)/(average use) for each house. This was to help us project the heaviest 24-hour water use from our BI-monthly water bills. The 50th percentile had a peak 2.1 times as great as their average. The 75 percentile (%); 2.5 times, 84%; 2.8 times, and the 90%; 3.1 times.

The "vast majority" of daily use from a house will be within 50% to 150% of that house's average daily water use. (EPA 1980). We used the 813 houses to quantify the EPA's assertion. The average "indoor use" figure for each house was multiplied by 1.5 and the number of daily readings

exceeding the average was counted for each house. On average, the houses exceeded 150% of their averages on 14% of the days. The mean was 15% of days. The number of exceeding days did not drop below 10% until the multiplier was 1.7 (170% of the average).

To summarize*: If a house has a monthly water use average of 240 gallons per day, one must expect that at least 4 days out of 30 exceeded 360 gallons a day of water use and that at least one of those days exceeded 504 gallons.*

The calculation of averages

To avoid having lawn irrigation or pool activity influence our water figures, a summer season was chosen for each year and those dates excluded from the study. The dividing points were dates in May and October and were selected based on the actual weather data from those years. The "winter averages" included proportional representation from water bills spanning the summer dates. All "winter" days for both years were then averaged together. The "Peak 60-day period" for each house was taken from water readings entirely within the winter season.

Results

All main parameters of the two house populations and their water use were compared with t-tests. There were no significant differences between the two test populations and their water use. It appears that the sewered Q1000 can be used to evaluate septic design.

The "*Residential End use of Water Study*" identifies Seattle and environs as having the second lowest water use per capita of the 12 participating cities. It appears, given this distinction, that King County data can be used for the rest of the state.

Bathrooms, bedrooms, and square footage all had positive linear associations to water use; however none of these variables are independent of each other. In both studies, when multiple regression was done, only square footage remained positive and significant within 95% confidence. None of the "r" values were strong, but square footage was definitely the best predictor of average water use.

The winter water use averages of 6% of the houses exceeded the Washington State design limits for their bedroom class. When multiplied by the standard1.5 peaking factor 16 % exceeded their design limits. When multiplied by the 2.1 "minimum peak 24hr factor" 41% exceeded their design limits.

Direction of the Project

It is likely that prolonged periods of heavy water use have a more permanent negative impact on a septic system than an occasional 24-hour peak. The highest 60-day water use figure has been selected for each house. These "prolonged peaks" probably represent a more sensible design target than just the over all "winter average". We will try to quantify the best predictors of prolonged peak flows and how those flows fit within current State design.

It is clear that as houses (within a bedroom class) get larger, their risk for exceeding their design limit increases. We hope to identify square footage numbers were the relative risk of exceeding the design becomes strong. We will then recommend square foot size limits for each bedroom class. In a similar vein, we hope to come up with a septic sizing scheme, based on 120gal/p/d steps, using only square footage.

Other jurisdictions, and engineers, have published bedroom/square footage schemes. Laura Benefield White, in her research paper for the RDC/TRC, sited many of these. We will test those schemes against our actual figures to see if any of them hit upon a good fit.

The ultimate purpose of this project is to develop a building remodel/expansion policy based on existing functioning drainfield capacity and proposed final square footage of the remodel.